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## ABSTRACT

Recent research in sociolinguistics has demonstrated the need for looking at language in a dynamic framework, that is, for not imposing the traditional synchronic-diachronic dichotomy on linguistic studies. Support for the dynamic framework has been given from various oral languages. This paper attempts to test variation theory with historically related visual languages, French Sign Language (FSL) and American Sign Language (ASL), by examining an historical change occurring in both languages, the change of two-handed signs on the face to one-handed signs. Data were collected from 135 deaf informants, 75 ASL signers and 60 FSL signers. Informants were selected on the basis of geographic location, ethnic origin, and sex. The results of this study support viewing languages in a dynamic framework, since traditional static theories have no formal mechanism to handle the inter- and intralingual variation that occurred in this study. The change from two-handed to one-handed signs patterned implicationally (in similar orders) for French and American signers. However, FSL is undergoing the change significantly more slowly than ASL. Older signers in both languages retain more of the older two-handed forms than younger signers. Within the U.S., Black Southern signers preserve more of the two-handed signs as compared with other U.S. signers. (Author/DB)

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## TWO TO ONE IT HAPPENS<sup>1</sup>

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1.0 Introduction. In this paper, we will examine one on-going change in various lects of two historically related sign languages--the change of two-handed signs on the face to one-handed signs in both French and American Sign Languages. The framework for the analysis is the dynamic sociolinguistic paradigm discussed by Bailey (1973) and others (Bickerton 1975, Fäscold 1975). This will allow us not only to specify how the change is in the process of occurring from a linguistic point of view but also to demonstrate that the rate of change depends on specific social factors.

Before discussing informants, data, and analysis, it will be useful to review briefly the historical relationship between French and American Sign Language as well as some of the pertinent literature on sign language phonology.

1.1 Relationship of French and American Sign Language. American Sign Language (ASL) is historically related to the French Sign Language (FSL) of the early nineteenth century. In 1816, T. H. Gallaudet, a hearing American who had learned FSL, and L. Clerc, a deaf French man, brought FSL to the U.S. Popular opinion states that ASL subsequently developed from FSL, but there is information that suggests that FSL was creolized with a sign language or languages already existing in the U.S. before 1816 (Woodward 1975a, b).

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It has been hypothesized (Woodward 1975b) that there were sign languages in use in the U.S. before 1816, that is before FSL was brought to the U.S. Because of poor transportation and the absence of any schools for the deaf in the U.S.,<sup>2</sup> these languages probably had great regional variations and more than likely were mutually unintelligible. It appears that FSL was creolized with existing varieties of sign language in the U.S., producing modern ASL. Evidence for this appears in a study (Woodward 1975b) comparing modern Parisian FSL with modern ASL. 872 modern French signs were researched. 42.7% of these were found to be non-cognates, that is they had no formational or semantic relationship to American signs. The study furthermore showed that existing procedures of glottochronology would date the arrival of FSL in America between 30 and 108 A.D., with a 90% level of confidence.<sup>3</sup> This 1700 to 1800 year difference may be explained through creolization, since massive restructurings occurring in the process of creolization can happen much faster than natural internal language change. The presence of fairly substantial amounts of restructurings like methathesis also supported the theory of early creolization of FSL upon its arrival in the U.S.

1.2 Sign Language Phonology. By sign phonology is meant the level of sublexical structure in a sign language that is analogous to but not dependent on the phonological component of oral languages (Battison 1974), that is, the finite formational aspect of duality of patterning. Stokoe in 1960 and 1965 initiated research on this level of structure in ASL and pointed out three parameters of sign formational units that were distinctive at the phonetic and relatively deep levels of ASL phonology: the tab or place where the

sign is made, the dez or hand configuration used to make the sign, and the sig or movement employed in making the sign. Battison (1974) suggests a fourth parameter of orientation for sign formational analysis. Bellugi (1972) has given further support to this kind of linguistic analysis through psycholinguistic tests that indicate that signs are processed in the short term memory in terms of these formational units, which she calls primes. Thus she presents evidence that these sign phonemes have as much psychological reality as sound phonemes do. Further research on slips of the hand (Battison and Erting 1974) and sign aphasia (Battison and Padden 1975) have shown similar findings.

Besides these synchronic studies of sign language phonology, there have also been diachronic studies (Frishberg 1974, 1975) and dynamic sociolinguistic studies in which synchronic and diachronic aspects were not artificially separated (Woodward and Erting 1975, Woodward 1974).

2.0 Data and Informants. Data for this study was collected in New Orleans in 1974, in Atlanta in 1974 and 1975 and in France during the summer of 1975.

Informants were chosen first according to their availability and further according to their age, ethnicity, and region in the U.S. and according to age and region in France. This study includes signs elicited from 40 white deaf informants in the U.S.: 16 informants over the age of forty-seven years and twenty-four informants less than forty-seven years of age. Also included in the study are signs elicited from 33 Black deaf informants under the age of forty-seven and two Black deaf informants over the age of forty-seven.

Several problems hindered us from finding Black deaf informants in the U.S. in Atlanta and New Orleans. In contrast to White deaf people living in the South, most (if not all) Black deaf informants living in the South do not have formal organizations or formal centers for meetings. In addition, most Southern Black deaf informants have to be located through face to face interaction, because most Black deaf people in the South do not own teletypewriters.

In France in the cities of Paris, Toulouse, Albi, and Marseilles, signs were elicited from 9 deaf informants over the age of forty-seven and from 51 deaf informants under the age of forty-seven.

Frishberg (1975) states that "for signs made in contact with the face, two-handed signs become one-handed." She further points out several examples of signs cited by Long in 1913 as two-handed, but by Stokoe and others in 1965 as one-handed. However, while doing research in the South, we noticed that these signs are still in the process of this change. We decided to search for the direction and rate of this change and chose twelve signs undergoing this variation that varied in formational parameters for testing in Atlanta and New Orleans: CAT, CHINESE, COW, DEER, DENY, DEVIL, DONKEY, FAMOUS, HORSE, INNOCENT, JAPANESE, RABBIT.

Some of these signs had to be rejected for the final analysis. DENY and INNOCENT were rejected since many of the Southern deaf informants did not have a single sign for this lexical item. Many of the informants had the same sign

for JAPANESE as they did for CHINESE, therefore JAPANESE was rejected.

The sign RABBIT was rejected as it was signed on the hands not on the face by many Southern informants.

Investigating FSL, we attempted to find cognates for the American signs. Signs that were rejected as non-cognates were: DENY, DEVIL, FAMOUS, HORSE, INNOCENT, JAPANESE. In addition to FSL-ASL cognates CAT, CHINESE, COW, DEER, DONKEY, FSL-ASL cognates GLASSES, MOUSTACHE, RABBIT, HORN were also elicited from the French informants. Thus we hoped to compare the direction and rate of change in France and in the U.S.

### 3.0 Analysis.

3.1 American Signs. The eight American signs that were noted to undergo two-to-one variation were tested with the 75 American signers and were found to be implicationally ordered. Table 1 shows the patterns and the number of informants in each lect. + means the informant has the older two-handed variant, - means he/she does not. With 8 signs and 75 informants there was a total of 600 responses. There were 46 exceptions to this implication, yielding a 7.7% rate of exception or a 92.3% rate of scalability.

Table 1. 2-Hand-to-1-Hand Implication (92.3% Traditional Fit)

| Lects | CAT | CHINESE | COW | DEVIL | HORSE | DONKEY | DEER | FAMOUS | No. |
|-------|-----|---------|-----|-------|-------|--------|------|--------|-----|
| 1     | +   | +       | +   | +     | +     | +      | +    | +      | 3   |
| 2     | -   | +       | +   | +     | +     | +      | +    | +      | 10  |
| 3     | -   | +       | +   | +     | +     | +      | +    | +      | 7   |
| 4     | -   | -       | -   | +     | +     | +      | +    | +      | 2   |
| 5     | -   | -       | -   | -     | +     | +      | +    | +      | 5   |
| 6     | -   | -       | -   | -     | -     | +      | +    | +      | 6   |
| 7     | -   | -       | -   | -     | -     | -      | +    | +      | 18  |
| 8     | -   | -       | -   | -     | -     | -      | -    | +      | 16  |
| 9     | -   | -       | -   | -     | -     | -      | -    | -      | 8   |

3.11 Features Conditioning Variation in American Signs. Certain phonological features appear to be conditioning the variation. Table 2 shows certain crucial shared features of the signs. Definitions of and rationale for these features are discussed after Table 3.

Table 2. Features Distinguishing American Signs

| Feature          | CAT | CHINESE | COW | DEVIL | HORSE | DONKEY | DEER | FAMOUS |
|------------------|-----|---------|-----|-------|-------|--------|------|--------|
| Outward          |     |         |     |       |       |        |      |        |
| Movement         | -   | -       | -   | -     | -     | -      | -    | +      |
| Facial           | +   | +       | -   | -     | -     | -      | -    | -      |
| Low              | +   | -       | -   | -     | -     | -      | -    | +      |
| Complex Movement | +   | +       | +   | +     | +     | +      | -    | +      |

These features can be weighed in relation as to how much they influence deletion.  $\alpha$  is the heaviest weighted feature, or the environment in which the deletion rule operates most frequently. B is the next heaviest weighted feature, and so on. Table 3 shows the relative weightings of features. We have not tried to account for the variation in each sign, but rather we have grouped signs into phonologically related sets.

Table 3: Weighted Features on American Signs

| Feature          | CAT       | CHINESE   | COW       | DEVIL     | HORSE     | DONKEY    | DEER      | FAMOUS    |
|------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Outward Movement | $\alpha-$ | $\alpha-$ | $\alpha-$ | $\alpha-$ | $\alpha-$ | $\alpha-$ | $\alpha-$ |           |
| Facial           | $\beta+$  | $\beta+$  |           |           |           |           |           |           |
| Low              | $\gamma+$ |           |           |           |           |           |           | $\gamma+$ |
| Complex Movement | $\delta+$ | $\delta+$ | $\delta+$ | $\delta+$ | $\delta+$ | $\delta+$ |           | $\delta+$ |

We are now only beginning to approach a natural phonology of sign languages based on physiological (Battison 1974, Siple 1973), developmental (McIntire 1974), and historical (Frishberg 1975, Woodward and Erting 1975) principles. At the present time, there appears to be no rationale for the feature outward movement from the body. Rationale for the other three features is tentative but in line with research in naturalness in sign phonology.

The deletion of one hand of a two-handed facial sign involves simplification of production and therefore loss of information from a receptive point of view. We therefore expect that deletion would be allowed first in those areas that are most visually salient. This is precisely what happens. Facial (Woodward 1973) describes a highly visually salient area (Siple 1973) from just above the eyebrows to just below the lips. Signs in this area are maximally perceptible. Low facial signs (like CAT) seem to be more in the center of the facial area than are higher facial signs (like CHINESE). Finally signs involving complex movement, such as the closing of the handshape in CAT, while complex productively, are probably quite simple from a receptive point of view, since complex movement would give more visual clues than a simple touch.

### 3.12 Correlation of Linguistic and Social Variation in American Signers.

It is possible to view this linguistic variation in its relation to sociological variables. For ASL we chose to look at informants on the basis of age, race, and geographical location. Table 4 shows membership in lects in relation to these three social variables.

Table 4: Membership of American Signers in Lects by Social Variables

|       | W    | W    | W   | W   | B    | B    | B   | B   |       |
|-------|------|------|-----|-----|------|------|-----|-----|-------|
|       | N.O. | N.O. | A   | A   | N.O. | N.O. | A   | A   |       |
| Lects | 47-  | 47+  | 47- | 47+ | 47-  | 47+  | 47- | 47+ | Total |
| 1     | 0    | 1    | 0   | 0   | 0    | 0    | 1   | 1   | 3     |
| 2     | 1    | 2    | 0   | 0   | 0    | 0    | 7   | 0   | 10    |
| 3     | 0    | 0    | 0   | 1   | 1    | 0    | 5   | 0   | 7     |
| 4     | 0    | 0    | 0   | 0   | 0    | 0    | 2   | 0   | 2     |
| 5     | 0    | 2    | 1   | 0   | 0    | 0    | 1   | 1   | 5     |
| 6     | 1    | 3    | 1   | 0   | 1    | 0    | 0   | 0   | 6     |
| 7     | 2    | 1    | 4   | 1   | 1    | 0    | 9   | 0   | 18    |
| 8     | 4    | 4    | 5   | 1   | 0    | 0    | 2   | 0   | 16    |
| 9     | 3    | 0    | 2   | 0   | 1    | 0    | 2   | 0   | 8     |
| Total | 11   | 13   | 13  | 3   | 4    | 0    | 29  | 2   | 75    |

Because of the small number of informants in some individual lectal patterns, we divided the lectal patterns into 2 by 2 charts for each variable for purposes of statistical calculation. Lectal membership was related to age and race. Only tables where  $p < .05$  are given. Table 5 shows membership by age for White informants.

Table 5: Membership in Lects for White Informants by Age

| Lects | White +47 | White -47  |
|-------|-----------|------------|
| 1-6   | 9 (56.3%) | 4 (16.7%)  |
| 7-9   | 7 (43.7%) | 20 (83.3%) |

A chi square test of this data showed a dependency relationship at  $p < .05$  ( $\chi^2=5.17$ ,  $df=1$ ) for age. White signers above forty-seven primarily grouped in lects 1-6, which use more old two-handed variants; white signers below forty-seven primarily grouped in lects 7-9, which use fewer of the old two-handed variants.

Table 6 shows membership by race for informants under the age of 47.

Table 6: Membership in Lects for Younger Informants by Race

| Lects | Blacks <del>24</del> 27 | Whites -47 |
|-------|-------------------------|------------|
| 1-6   | 18 (54.5%)              | 4 (16.7%)  |
| 7-9   | 15 (45.5%)              | 20 (83.3%) |

A chi square test of this data showed a dependency relationship at  $p < .01$  ( $\chi^2=6.89$ ,  $df=1$ ) for race. Black signers under forty-seven primarily grouped like the older White signers in lects 1-6 with more of the older two-handed variants; White signers below forty-seven primarily grouped in lects 7-9 which use fewer of the old two-handed variants.

3.2 French Signs. The nine French cognates that were chosen for testing with the 60 French signers were also found to be implicationally ordered, in fact identically ordered with the American signs if non-corresponding signs are eliminated. Table 7 shows the pattern and the number of informants in each lect. + means the informant has the older two-handed variant, - means h.e./she does not. With 9 signs and 60 informants there was a total of 540 responses. There were 30 exceptions to this implication, yielding a 5.6% rate of exception or a 94.4% rate of scalability, quite similar to the American rate of scalability.

Table 7: French Implication

| Lects | MOUSTACHE | CAT | CHINESE | GLASSES | COW | RABBIT | DONKEY | HORN | DEER | N |
|-------|-----------|-----|---------|---------|-----|--------|--------|------|------|---|
| 1     | +         | +   | +       | +       | +   | +      | +      | +    | +    | 3 |
| 2     | -         | +   | +       | +       | +   | +      | +      | +    | +    | 1 |
| 3     | -         | -   | +       | +       | +   | +      | +      | +    | +    |   |
| 4     | -         | -   | -       | +       | +   | +      | +      | +    | +    |   |
| 5     | -         | -   | -       | -       | +   | +      | +      | +    | +    |   |
| 6     | -         | -   | -       | -       | -   | -      | +      | +    | +    |   |
| 7     | -         | -   | -       | -       | -   | -      | -      | +    | +    |   |
| 8     | -         | -   | -       | -       | -   | -      | -      | -    | +    |   |
| 9     | -         | -   | -       | -       | -   | -      | -      | -    | -    |   |
| 10    | -         | -   | -       | -       | -   | -      | -      | -    | -    |   |

3.21 Features Conditioning Variation in French Signs. As seen from Tables 8 and 9 the same features with the same weightings are conditioning the deletion in FSL.<sup>4</sup>

Table 8: Features Distinguishing French Signs

| Feature          | MOUSTACHE | CAT | CHINESE | GLASSES <sup>5</sup> | COW | RABBIT | DONKEY | HORN D |
|------------------|-----------|-----|---------|----------------------|-----|--------|--------|--------|
| Outward Movement | -         | -   | -       | -                    | -   | -      | -      | -      |
| Facial           | +         | +   | +       | +                    | -   | -      | -      | -      |
| Low              | +         | +   | -       | -                    | -   | -      | -      | -      |
| Complex Movement | +         | +   | +       | +                    | +   | +      | +      | -      |

Table 9: Weighted Features on French Signs

| Feature          | MOUSTACHE | CAT       | CHINESE   | GLASSES   | COW       | RABBIT    | DONKEY    | HORN DE   |
|------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Outward Movement | $\alpha-$ | $\alpha-$ | $\alpha-$ | $\alpha-$ | $\alpha-$ | $\alpha-$ | $\alpha-$ | $\alpha-$ |
| Facial           | $\beta+$  | $\beta+$  | $\beta+$  | $\beta+$  |           |           |           |           |
| Low              | $\gamma+$ | $\gamma+$ |           |           |           |           |           |           |
| Complex Movement | $\delta+$ | $\delta+$ | $\delta+$ |           | $\delta+$ | $\delta+$ | $\delta+$ |           |

### 3.22 Correlation of Linguistic and Social Variation in French Signers.

For FSL, we chose to look at informants on the basis of age and geographic location. Table 10 shows membership in lects in relation to these two social variables.

Table 10: Membership of French Signers in Lects by Social Variables

| Lects | Paris |     | Albi |     | Marseilles |     | Toulouse |     | Total |
|-------|-------|-----|------|-----|------------|-----|----------|-----|-------|
|       | 47-   | 47+ | 47-  | 47+ | 47-        | 47+ | 47-      | 47+ |       |
| 1     | 7     | 3   | 7    | 5   | 12         | 1   | 2        | 0   | 37    |
| 2     | 1     | 0   | 7    | 0   | 1          | 0   | 1        | 0   | 10    |
| 3     | 0     | 0   | 1    | 0   | 1          | 0   | 0        | 0   | 2     |
| 4     | 0     | 0   | 1    | 0   | 0          | 0   | 1        | 0   | 2     |
| 5     | 0     | 0   | 1    | 0   | 0          | 0   | 0        | 0   | 1     |
| 6     | 1     | 0   | 0    | 0   | 0          | 0   | 0        | 0   | 1     |
| 7     | 0     | 0   | 0    | 0   | 0          | 0   | 1        | 0   | 1     |
| 8     | 0     | 0   | 0    | 0   | 0          | 0   | 0        | 0   | 0     |
| 9     | 0     | 0   | 0    | 0   | 0          | 0   | 2        | 0   | 2     |
| 10    | 0     | 0   | 1    | 0   | 0          | 0   | 3        | 0   | 4     |
| Total | 9     | 3   | 18   | 5   | 14         | 1   | 10       | 0   | 60    |

Because of the small number of informants in some individual lectal patterns, we divided the lectal patterns into 2 by 2 charts for each variable for purposes of statistical calculation. Lectal membership was related to age and geographic location. Table 11 shows membership by age for French informants.

Table 11: Membership in Lects for French Informants by Age

| Lects | French 47+ | French 47- |
|-------|------------|------------|
| 1     | 9 (100%)   | 28 (54.9%) |
| 2-10  | 0 (0%)     | 23 (45.1%) |

A chi square test of this data showed a dependency relationship at  $p < .05$  ( $\chi^2=4.81$ ,  $df=1$ ) for age. French signers above the age of forty-seven all patterned in lect 1 (categorical use of two-handed signs); younger French signers patterned primarily in lects 1 and 2, however, there were a significant number of people in other lects that had fewer older two-handed variants. This slight age differentiation shows that even though there is a significant

differences based on age, that the two-to-one change is only incipient for French signers, while it is well on the way for American signers. Table 12 shows membership by region for French informants.

Table 12: Membership in Lects for French Informants by Region

| Lects | Toulouse | All Other Regions |
|-------|----------|-------------------|
| 1-2   | 3 (30%)  | 44 (88%)          |
| 3-10  | 7 (70%)  | 6 (12%)           |

A chi square test of this data showed a dependency relationship at  $p < .005$  ( $\chi^2=13.29$ ,  $df=1$ ) for region. Signers from Toulouse grouped primarily in lects 3-10 which have fewer older two-handed signs. Signers from other regions grouped primarily in lects 1-2, which have more of the older two-handed variants.

4.0 Conclusion. This paper has examined the on-going change of two-handed signs on the face to one-handed signs in both French and American Sign Language. The direction of change at an average scalability of 93.35% was shown to be the same for the 75 American signers and the 60 French signers: 1) signs that have no outward movement from the face change the most quickly; 2) signs that are made in the salient facial area change before signs made outside that area; 3) signs that are made lower on the face change faster than signs made higher; 4) signs with complex movement change before signs involving simple movement.

The rate of change varied with social background factors of signers. French signers used older two-handed signs more than Americans ( $\chi^2=52.01$ ,  $df=1$ ),

$p < .001$ . Among French signers, signers over the age of forty-seven used older two-handed signs more than informants under the age of forty-seven. Signers from Toulouse used fewer older two-handed variants than did people from other regions. Older White Americans used older two-handed signs more than younger Whites. Finally, younger Blacks used older two-handed forms more than younger Whites. This trend for French signers to use older forms more than Americans was found in an earlier study by Woodward (1975a). Similarly, the trend for Blacks to use older variants more than Whites of the same age was found in earlier studies by Woodward (1974) and Woodward and Erting (1975).

It should be obvious from the data we present that language is a dynamic process, not a static object. If one insists on viewing language statically, the generalizations we have stated about direction and rate of change as well as the continuum nature of historically related languages and lects could not be made. In fact, if we accepted the view of some static linguists, we would have to deny what we observed, since Hockett (1958: 456-457) has observed "that while sound change is too slow to be observed, structural change is too fast." (Labov 1972, xiv)

More recently some historical linguistic studies (Chen and Wang 1975) have proposed the model of lexical diffusion which claims that a phonological change gradually spreads from lexical item to lexical item. Furthermore these studies have indicated that historical change is observable and may leave residue (Wang 1969) if competing changes start before the change in question is completed.

Sociolinguistic studies of variation such as those by Bailey (1973) and Bickerton (1975) have shown that variation in linguistic data may frequently be signs of linguistic change in progress. In fact, it is unwise to maintain that synchronic and diachronic are mutually exclusive. As Bickerton (1975: 17) states "a synchronic cut across the Guyanese community is indistinguishable from a diachronic cut across a century and a half of linguistic development and that therefore a grammar of the whole Guyanese continuum should be indistinguishable from the diachronic grammar that could have been written if all Guyanese had moved as close to standard English as some of them have."

Our data reveal a very similar situation across two historically related languages and within varieties of the same language as illustrated in the second paragraph of the conclusion.

One would be hard put to homogenize away all of the variation that was observed, label it "free" and market it to the linguistic consumer. The static question is, do we invent the ideal "speaker-listener" in this completely homogeneous "speech" community for our analysis or do we ask the real ideal "speaker-listener" to please stand up? The analysis presented offers an answer to one alternative dynamic question: how can the competences of all our informants be related in a polylectal grammar?

## NOTES

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<sup>2</sup> See Stokoe 1960 and Croneberg 1965 for the importance of residential schools in maintaining cultural solidarity in the deaf community.

<sup>3</sup> Gejl'man's (1957) research on Russian signs indicates that sign languages change at about the same rate as oral languages. Working with a 135 year time span, Gejl'man found only 2.5% of Russian signs that he had historical information about lacked similarities to modern Russian signs used today.

<sup>4</sup> Outward movement is redundant for French signs but is necessary for distinguishing American signs.

<sup>5</sup> The French sign GLASSES, unlike its American cognate, does not involve complex movement.

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